

**ABSTRACT OF THE DISCLOSURE**

A fuel system for an energy conversion device includes a deoxygenator system. A signal generator system includes a multiple of transducers located adjacent a fuel channel. The transducers are arranged to generate acoustic flow chaotization and cavitation-induced phase separation which destroys oxygen depleted boundary layers and significantly improving flow mixing, intensifying oxygen supply to the surface of an oxygen-removing membrane of the deoxygenator system.

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